Medical Students in Developing Countries: Some Benefits for Sure but a Mixture of Risks

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Over the past ten or fifteen years, medical students and, to the extent that their schedules allow, residents have shown increasing enthusiasm for global work, particularly electives in developing countries. While undoubtedly enriching, these experiences raise a set of diverse concerns. To contribute most effectively in resource-limited settings, U.S. medical learners must understand how to interact with local health care professionals as well as become informed about local circumstances, history and culture. This thoughtful preparation too often is not provided.[1] Many students seek out international opportunities on their own, show up, participate for a while and depart, without much thought for the effort required to orient them and support them in becoming clinically useful or for the void they leave when they go.[2]

Fortunately, medical schools and residency programs are increasingly taking responsibility for the organization and coordination of these international clinical experiences. Well-designed programs are able to establish a coherent curriculum for visiting learners, serve as a liaison between the home institution and the clinical site, and ensure that visiting learners are contributing and not just occupying space and consuming supervisory attention in their placements. However, this oversight does not obviate all problems; in fact, medical school and residency programs have had to deal with the kinds of challenges that have been familiar to international service organizations such as the Peace Corps for decades: random and targeted violence against westerners, motor vehicle and other accidents in areas with minimal infrastructure for emergency medical treatment, and the need to rapidly evacuate students and residents in the event of political instability.

The paper by Merlin et al. in this issue addresses a problem particular to individuals visiting developing countries to do medical work, the prevention and management of occupational exposure to potential infective body fluids, especially blood.[3] While medical students and residents are taught how to perform procedures while appropriately moderating their risk of occupational exposure, a variety of factors may compromise their ability to apply these lessons in developing countries, including lack of safety equipment such as self-sheathing needles. Simple unfamiliarity with the equipment in use in resource-limited environments may lead to accidents. Language barriers impair the operator's ability to explain what he is going to do and enlist the patient's cooperation. As the authors point out, medical trainees have far less experience with even simple procedures than they did a generation ago, as these tasks have been shifted to specialized teams, nurses, or moved to the interventional radiology suite.[4]

In 2009, presumably triggered by anecdotal reports of University of Pennsylvania medical students being exposed to body fluids while working in a organized university program in Gabarone, Botswana, the authors developed a systematic training for students preparing for this third-year and fourth-year inpatient elective. The stateside training was thoughtfully designed, using a progressive experiential format: from lecture, to viewing of instruction videos, to work on task trainers, to practice under the supervision of phlebotomists. Once in country, the first five occasions of the simple procedures, phlebotomy and intravenous line placement, were supervised, while more complex procedures, such as thoracentesis, were always observed. The impact of this training was assessed by retrospectively surveying students; pre-intervention students who had worked in Botswana between July 2007 and March 2009 were surveyed in May 2009, the intervention group who had participated in the elective between April 2009 and February 2010 were surveyed in April 2010. Despite the longer interval between early students and the administration of the survey in the pre-intervention group, the response rates were high and comparable in both groups. I know from personal experience that it is unlikely that students in either group forgot significant body fluid exposures.

There was a dramatic decrease in needle sticks after the institution of the training, with 8 of 48 responding students in the pre-intervention group reporting a needle stick compared to 0 of 19 responding students in the intervention group. Although close ($p=0.07$), these results did not achieve statistical significance because of the small size of the intervention group. Unfortunately, splash exposures were almost as common as needle sticks in the pre-intervention group and did not decrease after training, perhaps because goggles were not available or students were electing not to use them. Overall, 17 students had 18 exposures (one student had two splash exposures), 15 exposures were reported to supervising physicians, and 12 students initiated post-exposure prophylaxis (PEP) with antiretroviral medications.

The psychological distress experienced by this small sample of medical students after their exposures is noteworthy. Embarrassment, fear, and reluctance to disclose the exposure were the most commonly endorsed emotional responses. Apprehensiveness about the implications of the exposure is to be expected; what is striking is the degree of guilt and shame reported by the

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students. This is reminiscent of the medical errors literature; the psychological toll of making a mistake, particularly one that directly results in harm to a patient, has been well described.[5] But in this instance, to the extent that the exposure even reflects an error, the cost of that mistake is borne by the clinician, not the patient. Perhaps the shame resulted from students' loss of a sense of competence as a consequence of the exposure or perhaps the experience of waiting for follow up HIV testing "in public" led to the intense discomfort some students clearly suffered. The study design does not permit a deeper understanding of what one student called "humiliation".

What are medical educators at other schools to take from the study of Merlin et al.? Although the pre-post differences did not achieve statistical significance for any outcome variable, needle sticks, splashes or total exposures, common sense argues that trainees who will be working in areas where blood-borne infections are prevalent should be carefully prepared to perform the procedures that will be expected of them and that medical schools and residency programs that fail to do this are shirking an important responsibility and quite possibly incurring a legal exposure. However, this study has broader implications. If a relatively modest intervention produced the kind of improved performance suggested by the Merlin study, what does that say about our usual approach to teaching procedures? The authors state that prior to the development of this program, "procedural training was available to University of Pennsylvania medical students". However, they do not describe the content of this training nor the number of students who avail themselves of it. Thus, it is difficult for faculty at other schools of medicine predict the marginal benefit of upgrading their procedural instruction to something like the augmented Penn program. However, we do know that instruction in procedures, even basic procedures such as phlebotomy and intravenous line placement, is deteriorating and that residents, to whom here in the U.S., we have delegated responsibility for the instruction of medical students, feel uncomfortable in their supervisory role.[6]

One aspect of this paper made me uneasy. Surveillance and reduction of needle stick and splash accidents are important across the range of health professionals in the settings where these students are working. I understand the special responsibility that the home institution bears for its enrolled students but it seems to me ethically important to design the program in such a way that it benefits not just the visiting students but also the staff in the hospitals that are hosting them. This may be a particularly poignant issue when it comes to the goggles the authors reasonably enough propose to use to bring down the number of splash exposure. I have worked in HIV care a bit in East Africa and have never seen goggles in use. What would it mean to have medical students from the US working side by side, as I hope they are, with African medical students, but provided a different level of personal protection? Twelve students initiated PEP; do health care workers in sub-Saharan Africa have access to antiretrovirals to prevent occupational transmission? But perhaps the Penn students are working under the supervision of Penn faculty and are entirely insulated from African medical students and Botswanan physicians. This is, unfortunately, a common model; on hospital campuses throughout sub-Saharan Africa, one can see the outposts of US universities, NGO's and government agencies where clinical work and research is being conducted in parallel with, but isolated from, national efforts. As we respond to our learners' eagerness for opportunities to work abroad, part of thoughtful program design is ensuring that young professionals have the opportunity to work together and learn from each other. It is this respectful collaboration that distinguishes global service from medical tourism.[7]

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